Tablet Formulations of Herbal Extracts Mimosa pdica Linn with Direct Compression Method

. Sri Adi Sumiwi, Kirthikaa Gopal Krishnan, Marline Abdassah,

Faculty of Pharmacy FMIPA UNPAD, Jatinagor-Sumedang

Email: sri.adi@unpad.ac.id

ABSTRACT

The research about tablet formulation and manufacturing technology from extract of Mimosa Pudica Linn by direct compression method has been carried out. The aim of this research was to obtain a well-criteria tablet as pharmaceutical dosages form. The formula contain of Mimosa Pudica Linn extract, VIVAPUR®PH102, Primogel, Talk, AEROSIL200 and Mg-stearat. Six formula were made based on different concentration of VIVAPUR®PH102 (81%, 82%, 83%, 84%, 85%,86%). The evaluation result of tablet showed all formulas have a well criteria tablet, and with the increasing of VIVAPUR®PH102, the friabillity was decreased and the disintegration rates was increased, Statistical analysis using One Way ANAVA and continued by Newman-Keulls showed six different concentration of VIVAPUR®PH102 gave a significant different effect on tablet disintegration rates. VIVAPUR®PH102 86% gave the fastest disintegration rates(4menits and 40 second) and the best friability (0,12%). Thin Layer Chromotography (TLC) showwed the same pattern (two spots) between extract and tablet, which means flavonoid contained in extract also contained in tablet.

Keywords: Tablet, Mimosa Pudica, Direct copmpression

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PENDAHULUAN

Mimoosa pudica Linn has been known to have various pharmacological effects. Among these are, as antidiabetic

activity, antitoxin, antihepatotoksin antiinflammatory, antioxidant, wound

healing, analgesic, and blood diseases (S.Varnika et. Al, 2012).

The result of phytochemical screening herbal botanicals and extracts Mimosa pudica Linn. showed a class of flavonoids, tannins, polyphenols, monoterpenoid, seskuiternoid, steroids, saponins, and quinones. According to a herbalist as well therapists Natural Health Centre in Depok, West Java, Mimoosa pudica contain melatonin. According to the most efficacious compound is melatonin, which gives a relaxing effect on the nervous cerebellum.

RESEARCH METHODS

The study was conducted through the following phases:

1. Preparation of raw materials and the determination of plant
2. Extraction herbaceous Mimosa pudica Linn and evaluation of active ingredients
3. Preparation of raw materials and the determination of plant
4. Preparation of raw materials and the determination of plant
5. The tablet formulation
6. Extraction herbaceous Mimoosa pudica Linn and evaluation of the active ingredient
7. Drying viscous extract Mimoosa pudica Linn

RESULTS AND DISCUSSION

1. Determination of Mimosa Pudica

Determination made in Labratorimm Taxonomy Department of Biology FMIPA Universitas of Padjadjaran Jatinagor show that plants used in the formulation is Mimosa pudica (L.)

2. Tablet Formulations Herbal Extracts Mimosa pudica Linn

The active substance in the form of dried herb extracts Mimoosa pudica Linn used in each formula of 11.5%. Additives used are VIVAPUR®PH12, Primojel, Talc, Magnesium stearate AEROSIL200 and. VIVAPUR®PH102 than as a binder and filler are also crusher, primojel is functioning as a disintegrator, combination with talc, magnesium stearate and AEROSIL200 also is functioning as absorbent, it is very well used for the manufacture of tablets with active substance in the form of extracts, which have a high water content.

Tablet is divided into six formulas distinguished by its VIVAPUR®PH102 concentration, concentration primojel adjusted, whereas the concentration of Mg-stearate, and talc AEROSIL200 remain in each formula. A complete comparison of dry extracts and substances on each formula such as:

Tabel 1. Arrangement of six Extract Formula Mimosa Pudica Linn Tablet

Formulation / composition	Formula A(%)	Formula B(%)	Formula C(%)	Formula D(%)	Formula E(%)	Formula F(%)
Ekstrak putri malu	11,5%	11,5%	11,5%	11,5%	11,5%	11,5%
VIVAPUR®PH102	81%	82%	83%	84%	85%	86%
Primojel	5%	4%	3%	2%	1%	-
Mg, stearat	1%	1%	1%	1%	1%	1%
Talkum	1%	1%	1%	1%	11%%	1%
Aerosil	0,5%	0,5%	0,5%	0,5%	0,5%	0,5%

2.Evaluation of Mass Print Tablet

Before printing, the print mass of six powder formula is evaluated first. This test is included in praformulasi stages, indicated to see if the print mass powder can be used as a tablet or not. Evaluation results were found is the real density, incompressible density, true density, water content, compressibility and flowability is as follows.

Table 2.. Evaluation of six Extract Formula Mimosa Pudica Linn Tablet

Evaluation	Formula A	Formula B	Formula C	Formula D	Formula E	Formula F
Water content (%)	2,1	2,6	3,1	3,9	4,1	4,9
Real density (g/ml)	0,42	0,4	0,39	0,38	0,33	0,33
Incompressible density (g/ml)	0,51	0,49	0,49	0,48	0,45	0,45
Compressibility (%)	16,95	17,73	20,30	21,22	24,32	26.66
True density (g/ml)	1,7854	1,6171	1,5377	1,4948	1,4439	1,1425
Flowrate (g/dtk) (without vibratin)	-	-	-	-	10±0,0	10±0,0
Flowrate (g/dtk) (with vibration)	6,86	6,76	6,48	6,49	6.48	6,5
Angle rest (0)(without vibration)	-	-	-	-	21,51˚	20,65˚
Angle rest (0)(with vibration)	19,61˚	16,18˚	26,04˚	25,54˚	25,07˚	28,14˚

2.1 Evaluation of Real density, incompressible density, and compressibility

From the results of testing the real density and density incompressible used to demonstrate the compressibility of the mass of the tablet printing. The results of calculation of the printed mass compressibility obtained Carr index of 16.95 to 26.66%. The index value indicates compressibility less than the mass of the tablet printing. Krang compressibility of printed mass and less particles are not uniformly great compress density.

2.2 Evaluation of Flow Speed and Angle Rest.

Testing the flow velocity and the angle of rest is designated to see the flow properties of powders Concentrations below 84% VIVAPUR® PH102 printed mass Tablet can not flow. Mass of VIVAPUR®PH102 can flow at a concentration of 85% and 86% at a flowrate of 6,5g / sec. Concentration avicel, VIVAPUR®PH102 sizable make Tabet printed mass can flow. Angle rest mass break mimosa pudica extract tablets ranged 20,65^{o} to 21,51^{o}. Based on these values indicate where the printed mass has excellent flow properties.

The results of examination by using a flow rate of vibration shows all formulas can flow. Flow rate ranged from 6.86 to 6,5g / sec and the angle between 19,61^{o} up

to 28,15°. Based on this value can be inferred printed mass that tablet has excellent flowability.

The good flow due to a combination of lubricants used that are talc, magnesium stearate and AEROSIL200. Three of these substances can overcome the sticky particles to one another, thereby reducing the friction between the particles for example magnesium sterat that works by forming a layer on the particles of solid material, causing the covering in total or in part.

2.3 Evaluation of Water Content

The results of testing the water content of all formulas are in the range of two to four percent. Water content (within acceptable limits) can also act as a tablet binder resulting in low friability of tablets. For example, the granules are very dry and only contain a small percentage of moisture, often produces more crunchy than granule tablet moisture content of 2 to 4%.

3.Preparation of ExtractMimosa Pudica Tablet

Printing is done by using a tablet machine with m Korsch made for 300 tablets. Tablets are printed in pencetakkan the formula as much as ± 300 tablets. By using the direct printing method.

4. Evaluation of preparations Tablet So

Evaluation of Tablet So preparations intended to see whether the tablets met the requirements for a good tablet or not. The test results so the tablet is as follows:

Tabel 3. Evaluation results preparations Tablet of Six Formula

Evaluasi	Formula A	Formula B	Formula C	Formula D	Formula E	Formula F
Weight (mg)	499,33	497,14	498.49	499,88	498,65	497,03
Thickness (mm)	4,35	4,40	4,52	4,6	4,91	5,34
Diameter(mm)	12,10	12,10	12,10	12,10	12,10	12
Hardness (N)	82,45	83	84,4	85,4	86,5	84,2
Friability(%)	1,02	0,71	0,42	0,33	0,14	0,13
disintegration time (minute)	4,4	3,48	3,3	3,4	3,5	1,4

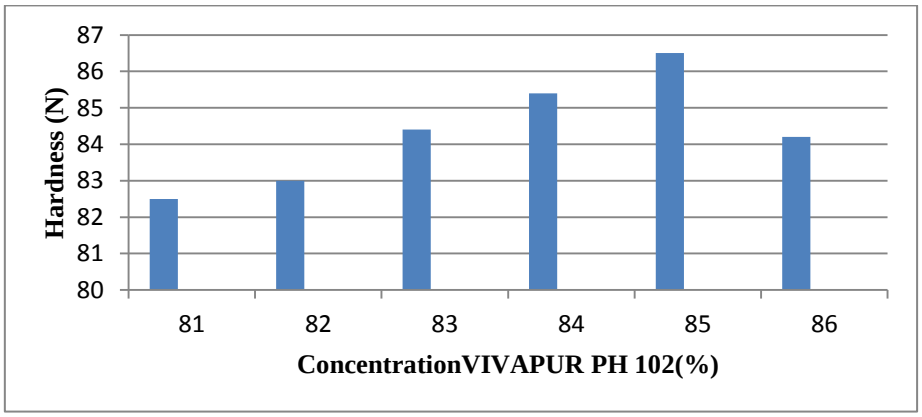
4.1 Tablet appearance and uniformity preparations

The resulting tablets tablet form convex on both sides, white mottled brown. Smelling aromatic and has a slightly spicy flavor. Its surface is smooth and solid consistency. The diameter and thickness of tablet are generated as shown in Table 3 meets the requirements of USP XXIV, which states that the diameter of the tablet should not be more than three times and not less than one third of the thickness of the tablet.

While the weight of the tablet also has met the requirements of USP XXIV shown with no two tablets weighing beyond the boundaries of a percentage,
and not a single tablet that weighs more than twice the percentage of the allowable limits.

4.2 Tablet hardness and friability.

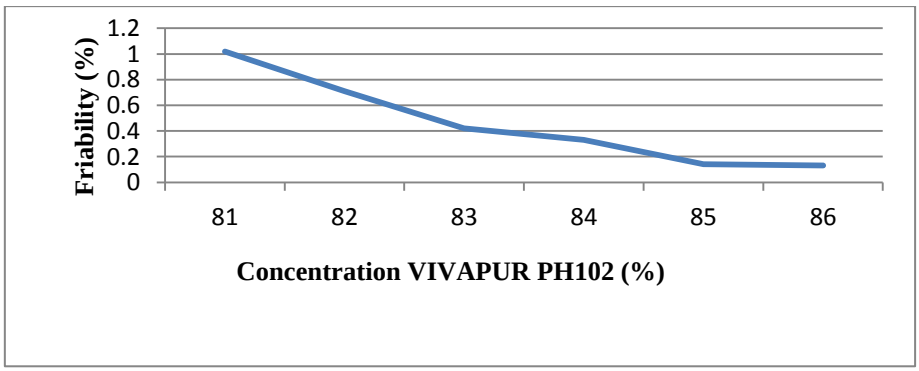
Tablets should have a certain hardness and crispness resistant in order to withstand mechanical shocks during manufacture, packing and shipping. Testing tablet hardness testers here using Erweka.



Picture 1. Diagram of VIVAPUR PH102 concentration vs hardness

Hardness of tablets every formula range ± 85N. In testing the variation seen between tablet hardness test or the heterogeneity of violence. Hardness or strength tablets, as well as its thickness is a function of the content of the die and compression forces. Tablet friability test results herb extract mimosa pudica.

showed a decrease in the percentage friability with the increasing concentration of VIVAPUR®PH102, but everything is still included in the maximum friability percentage requirements contained in the USP XXV, amounting to 0.8%.



Picture 2. Graphic of VIVAPUR PH 102 Concentratioon vs%friability

4.3 Time Destroyed Tablets

The timing was destroyed produce increasingly rapid disintegration time consecutive also from formula one to five. The relationship between the concentration VIVAPUR the disintegration time can be seen in Figure 3

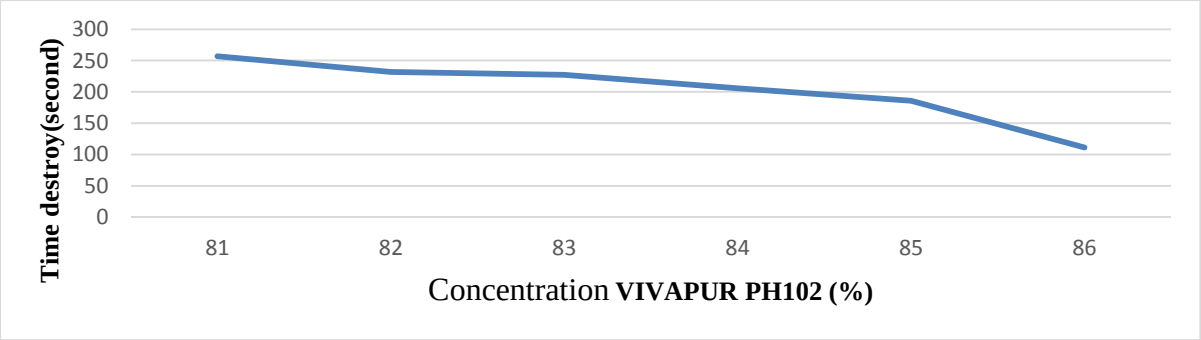


Figure 3. Relationship Graph VIVAPUR®PH102 Concentration vs. Time Destroyed

From the figure it can be seen that the relationship between increased concentration and a decrease in the length of time VIVAPUR destroyed almost linear. From the statistical test results also showed that vivapur provide a significantly different effect on tablet disintegration time.

4.4 Examination Compound Bookmarks by TLC

Examination of marker compounds by Thin Layer Chromatography (TLC) was carried out to see whether the active compound contained in the extract was There are also in the tablet. Evaluation is done by comparing the results TLC ekstract the six formula using n-hexane : ethyl acetate = 7: 3. Selection of solvent based on the nature of the active compound is semipolar.

TLC showed the formation of two yellow-green spots with Rf 0.32 and 0.83, when sprayed with 10% H2SO4 reagent (reagent common flavonoids) that parallel between the fifth extract tablet formula. With this, it is seen that the mimosa pudica flavonoids contained in the extract is still contained in the tablets.

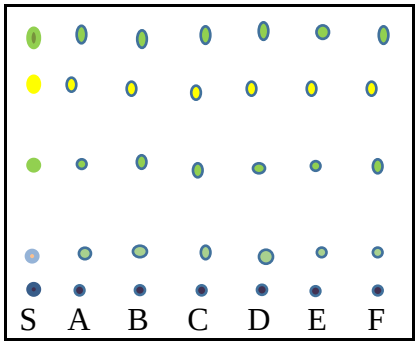


Figure 4. Results of TLC Extract and Six Formula Tablets Mimsa Pudica Linn

CONCLUSIONS AND SUGGESTIONS

Conclusion

Based on the research that has been done, it can be concluded that plant extract (Mimosa pudica Linn) can be done into tablets which meet the requirements as a pharmaceutical preparation either using direct compression metode.

In the formulation we want in six formulas with concentrations varying VIVAPUR®PH102. This is done to see VIVAPUR®PH102 influence on the quality of tablet. prior to preses printing, mass test. Evaluation. They were made as supporting processes in the printing process.

Tablets of mimosa pudica extract printed quality tested and seen VIVAPUR®PH102 influence on the results of each evaluation tablet so. Based on the quality of the test tablet that has been done, the greater the concentration of VIVAPUR®PH102 will accelerate tablet disintegration time and lower the percentage friability.

Based on the results of thin layer chromatography can be concluded that is still extract nutritious substances contained in the tablets after going through the stages of formulation.

5.2 Suggestions

From the research that has been done, it can be suggested to:

1. In order to do research on the further activities on mimosa pudica extract tablets that have been made.

2. Should be done more research on pe on other preparations that contain extract mimosa pudica as the development of dosage forms that have existed

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